

*Gallon, Portable Hydrogen  
Generator*

26 May 1958

**CONFIDENTIAL**

**MEMORANDUM FOR: Office of Logistics/Procurement Division/Contract Branch**

**SUBJECT: Request for Additional Funds under Task C of Contract  
RD-26 with [redacted]**

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1. Supplement #1 to Task C under Contract RD-26 with [redacted] was issued in June 1957 for an increase in the scope of research directed toward the development of a prototype portable hydrogen generator. As a first step, a one-fifth scale generator was constructed for the purpose of studying the scaling up problems that might be encountered in the full scale generation. Tests with the one-fifth scale generator have shown more problems to exist than were originally anticipated. Further testing with the one-fifth scale unit is advisable before proceeding to the full scale generator and it is for the purpose of providing funds for these additional tests that the contractor has requested an additional amount of money.

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2. It is therefore requested that Task C be amended in the amount of \$4,736.00 in accordance with the contractor's proposal attached hereto. Charges for these additional funds are to be made against Allotment Number 9-2502-10.

3. Further information concerning this request may be obtained from the project engineer, [redacted] Room 210, West Outbuilding, [redacted]

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Chief

TSS/Engineering Division

**Attachments:**

DDG-213-27-1484-38

Contr'r Proposal Dtd 9 May 1958

**APPROVED FOR THE OBLIGATION OF FUNDS:**

Research Director

DD/P/TSS/OT [redacted]

**Distribution:**

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DOC 43	REV DATE 12/6/80	BY 55227
ORIG COMP 056	CPI 56	TOT 02
ORIG CLASS 5	PAGES 7	REV 0000

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In replying please address:

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May 9, 1958

Dear Sir:

As of June 28, 1957, research was initiated, under Supplement No. 1 to Task Order No. C, on the program directed toward the development and evaluation of a prototype full-scale (about 3,500 cu ft) hydrogen generator, with your technical representatives' stated specifications being goals for the experimental device.

In the performance of the research thus far, as previously contemplated, the experimental small-scale generator has been procured and used for conducting experiments to investigate pertinent variables such as the effects of the sodium borohydride dispersion, and of the relation between the cobalt chloride concentration and the initial temperature, on the generation rate. Also, as the research has progressed, necessary repairs have been made on this experimental unit; design modifications directed toward improving this unit, and ultimately the experimental full-scale generator, have been applied and evaluated; and needed accessories have been designed, prepared, and investigated. Further, a fixed-price purchase order has been placed for the experimental full-scale generator.

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The 13 experiments which have been conducted to date in the experimental small-scale unit substantially conclude the development effort in this unit, as described in our proposal dated March 27, 1957. However, on the basis of the data obtained, it appears that the generation reaction in the experimental full-scale unit will probably be considerably more complex, and the scaling-up problem will be more rigorous, than could be anticipated from the results of the previously conducted feasibility study in the laboratory. Consequently, it appears necessary for additional experiments to be conducted in the experimental small-scale unit in an attempt to obtain data which, together with the above-indicated experimental results, would provide a sound basis for arriving at the scaling factor to be applied to pertinent variables, such as catalyst concentration, in setting up the contemplated experiments in the experimental full-scale unit. As has been discussed previously, in view of the cost of the sodium borohydride and the amount needed, the full-scale experiments will be quite expensive. Consequently, it is particularly essential, in this instance, that sufficient information relative to the basic generation reaction be developed in the experimental small-scale unit so as to permit obtaining the maximum of information from the small number of experiments planned in the experimental full-scale unit.

Thus, it appears prudent to perform at least five additional experiments in the experimental small-scale generator.

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As currently contemplated, approximately three of these would be conducted at half pool depth (1/10 scale) and at the same initial temperature, namely, approximately 65 F, which is on the high side of the range under anticipated service conditions; the amount of cobalt chloride would be varied. The data obtained would be analyzed and compared with those from the previous experiments. Subsequently, at least two experiments would be performed at full pool depth (1/5 scale); the initial temperature and the catalyst would be selected on the basis of the previously obtained data. The results would be interpreted, and then all of the experimental data obtained from operating the experimental small-scale unit would be analyzed with the objective of determining the concentration of catalyst, the initial temperature, etc., to be used in connection with the full-scale-unit experiments.

All of the considerations pertaining to the performance of the research in connection with the experimental full-scale unit, and to maintaining liaison with your technical representatives, as described in our proposal dated March 27, 1957, would still apply.

It is hereby proposed that the Task Order No. C be amended to provide for the additional research, as described above, directed toward the further investigation of the scaling factor to be used in setting up the contemplated full-scale-unit

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experiments. It is also proposed that the amendment provide for an increase in the estimated appropriation of \$4,768, including an increase in the fixed fee of \$270. A general breakdown of the estimated appropriation increase is attached. It is expected that the effort under the amended contract could be concluded within the current research period (ending August 31, 1958), if the amendment is received promptly.

Of course, the proposed amendment would continue our period-basis research agreement, consistent with our current contractual arrangements.

It is currently expected that, on the basis of the results obtained from the above-described additional research, it will be possible to set up the small number of full-scale-unit experiments so as to provide data indicative of a favorable performance by this experimental unit. Also, it is anticipated that the experience gained from operating the experimental full-scale unit under these conditions would be useful in any subsequent activity relating to this unit - for example, in the preparation of an operator's manual, if desired; of course, any such effort would be set up under an additional contractual arrangement.

If you should have any questions with regard to the additional research proposed herein, please do not hesitate to

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call us. Any inquiries of a contractual nature may be directed to

[Redacted]

at Extension 159.

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Very truly yours,

[Redacted]

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Vice President

[Redacted]

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In Duplicate

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